

R-C Thermal Model Parameters

DESCRIPTION

The parametric values in the R-C thermal model have been derived using curve-fitting techniques. R-C values for the electrical circuit in the Foster/Tank and Cauer/Filter configurations are included. When implemented in P-Spice, these values have matching characteristic curves to the single-pulse transient thermal impedance curves for the MOSFET.

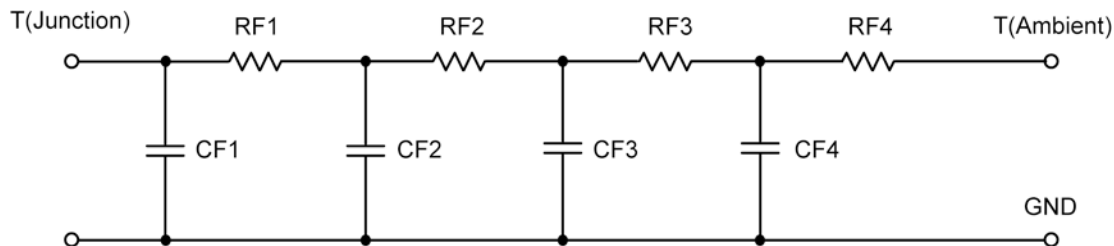
These RC values can be used in the P-SPICE simulation to evaluate the thermal behavior of the MOSFET junction temperature under a defined power profile. These techniques are described in Application Note AN609, "Thermal Simulation of Power MOSFETs on the P-Spice Platform."

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION				
Thermal Resistance ($^{\circ}\text{C}/\text{W}$)				
Junction to	Ambient CH-1-Schtky	Ambient CH-2-Mos	Foot CH-1-Schtky	Foot CH-2-Mos
RT1	8.0569	10.7677	19.4787	10.3256
RT2	23.3179	31.5090	20.6354	17.0738
RT3	37.3670	22.3689	5.2804	3.5711
RT4	41.2582	45.3544	9.6055	9.0295
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)				
Junction to	Ambient CH-1-Schtky	Ambient CH-2-Mos	Foot CH-1-Schtky	Foot CH-2-Mos
CT1	36.0122 u	48.9919 u	77.0818 m	76.2765 m
CT2	1.7537 m	49.1773 m	6.2677 m	4.4897 m
CT3	19.4447 m	3.6701 m	60.6550 u	92.0322 u
CT4	583.6896 m	1.5378	812.5700 u	1.0286 m

This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION

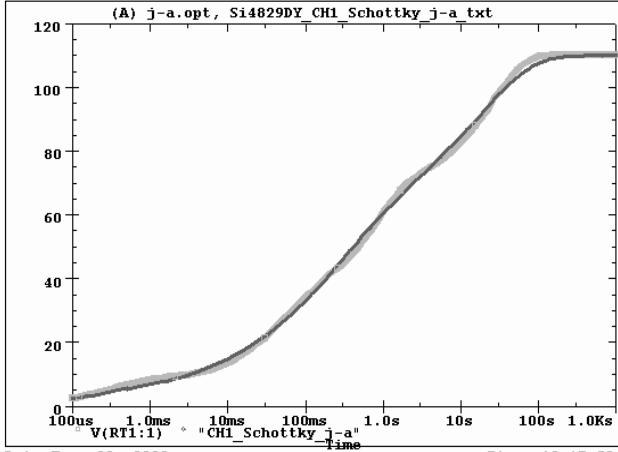
R-C VALUES FOR FILTER CONFIGURATION				
Thermal Resistance (°C/W)				
Junction to	Ambient CH-1-Schtky	Ambient CH-2-Mos	Foot CH-1-Schtky	Foot CH-2-Mos
RF1	9.7619	13.0039	8.0128	5.4872
RF2	29.7961	22.3467	14.7112	15.4698
RF3	33.7741	30.7887	20.9570	13.3751
RF4	36.6679	43.8607	11.3190	5.6679
Thermal Capacitance (Joules/°C)				
Junction to	Ambient CH-1-Schtky	Ambient CH-2-Mos	Foot CH-1-Schtky	Foot CH-2-Mos
CF1	57.9766 u	92.4244 u	74.8125 u	93.0083 u
CF2	1.9414 m	3.8067 m	1.2901 m	1.1321 m
CF3	25.6616 m	41.1363 m	9.7250 m	7.5917 m
CF4	673.6599 m	1.5190	171.5880 m	215.7949 m

Note

NA indicates not applicable



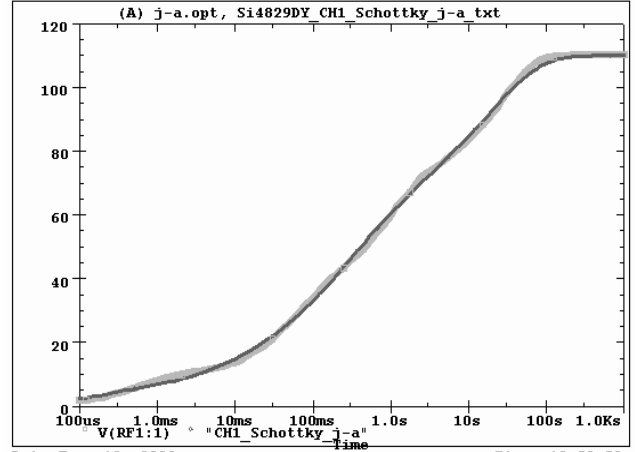
Si4829DY Tank j-a CHI Schottky Temperature:27.0



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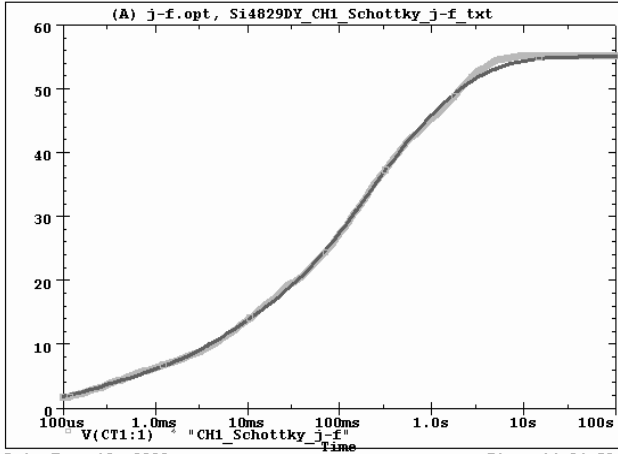
Si4829DY Filter j-a CHI Schottky Temperature:27.0



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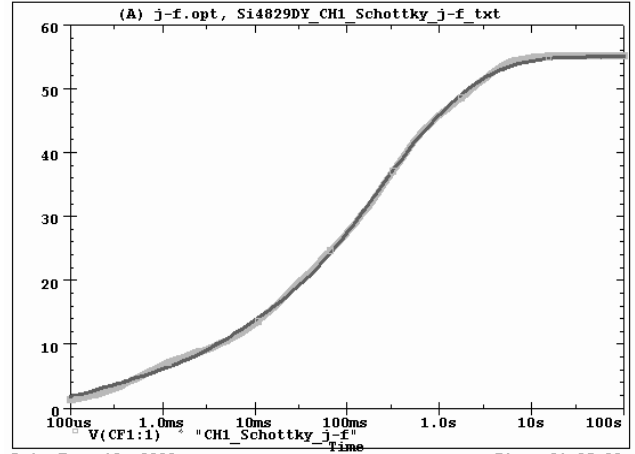
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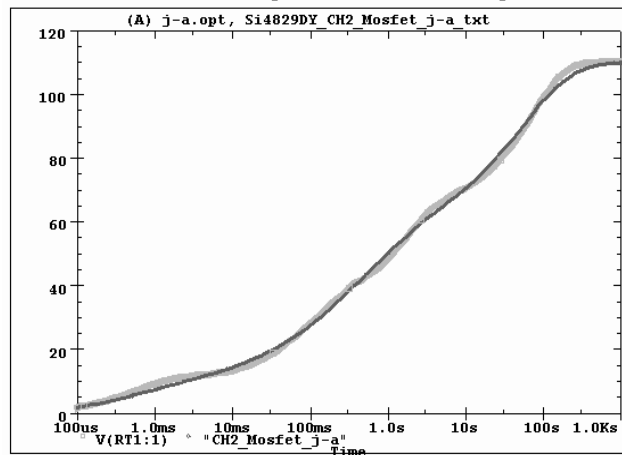


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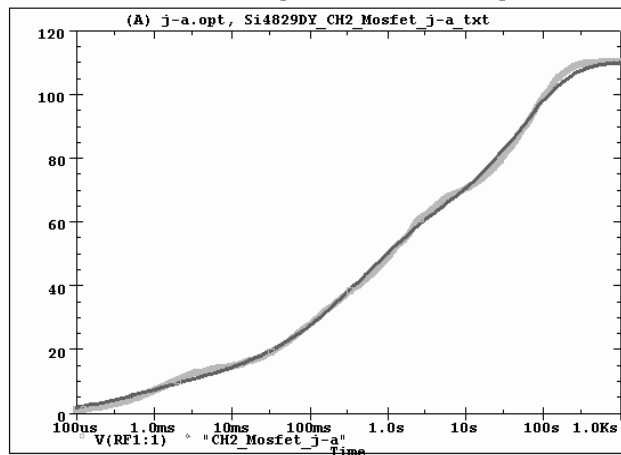
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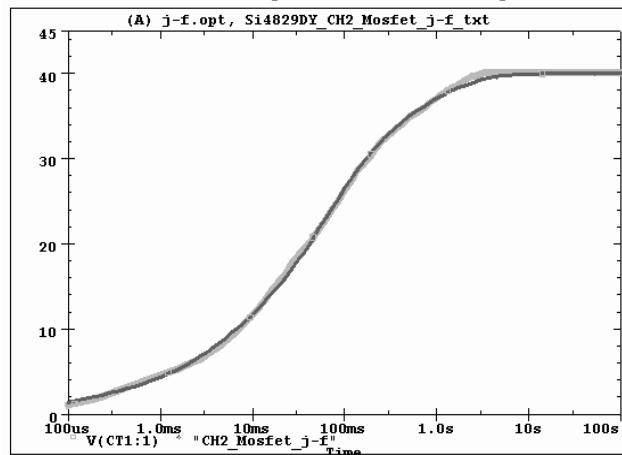
Si4829DY Tank j-a CH2 Mosfet Temperature:27.0



Si4829DY Filter j-a CH2 Mosfet Temperature:27.0



Si4829DY Tank j-f CH2 Mosfet Temperature:27.0



Si4829DY Filter j-f CH2 Mosfet Temperature:27.0

